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FIELD BOOK

OF

DAVID FAIRCHILD

BEGUN ON THE HIGH SEAS
EN ROUTE PANAMA TO NEW YORK
AUGUST 16TH 1924.

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Before the remarkable impressions of the visit to Panama fade I want to jot some of them down. Never thought I was so tired after each day of excitement, that I could not do much note writing at the time.

I could hardly believe ~~[illegible]~~ that the Zone was the same place Horticulturally as the place which Jewett & I visited 3 years ago. Let me draw the comparisons.

Three years ago we landed with our wardian cases, were met by the Cattle man Mr Humphrey who sent our cases to a miserable place in Colon watched over by a colored man who had a collection of straw hats, and who knew or cared nothing about plants. We went to Juan Mina a neglected place also under negro management or rather mismanagement and we stayed in Martin's house ~~and~~ at Gamboa. There were no grafted avocado or mango trees in the Zone and I took off my coat and put in buds into private gardens in several people's back yards. Whitney & Wilsons for example.

and together with Humphrey & Berries put in some beds at Frijoles.

Today I find a Plant Introduction Garden at Summit where $21000 a year has been spent and which is better planned than many of our own Gardens. A dripless Plant house full of plants. A propagating box in action. Large nurseries of successfully grafted Mango & budded mango seedlings from which were distributed thousands of fiberless mangos & good varieties of avocados. I find a very intelligent man in charge. Johansen. and his assistants who have been well trained. ~~All the trees~~

I find the specimen trees on all the driveways labelled as in no other place I have visited in the tropics. and I find an awakened interest in plants which I never suspected could be built up so quickly in Panama.

To All this ~~aside from~~ is added the growth of all the trees into shady avenues, the bamboos into great clumps 40-50 feet tall and the flowering of such species of trees as Cassia Siamea along the driveways.

This change is truly spectacular enough but when you add to all this a Laboratory on Barro Colorado Island where I spent two or more weeks in company with three of the most brilliant and accomplished scientific men in America — in the very midst of the Surgeon tropical jungle — taking photographs with my long focus Camera and working with my microscopes — the transformation from a place where there was no special interest in plants at all to one where a wider circle of people are getting to know about it — is ~~comp~~ very surprising. — and all in 3 years time.

To make the ~~matter~~ contrast seem more remarkable. I was privileged to hear in a packed house Dr. Wheeler give a masterly discourse on Ants. He said as he left us & went to bed. "I suppose that will be my last lecture on Ants I'm tired talking about them"

I was asked to give a lecture on "Mangosteens and Quarentine" & I did — with lantern slides. See newspaper clippings in previous note book. At this lecture I showed fruits of Garcinia tinctoria which Johansen gathered for me from the tree of this species on the driveway.

Wheeler of Bussey came over to Cristobal to meet us at the Steamer and we took the train at once for ~~the~~ Panama.
From this start off — the glorious green scenery of that ride across the Isthmus is an unforgettable thing anyway — to the last day on the Steamer in New York the personality of Wheeler has taken a part — yes the major part. for of all the persons I have travelled with I think he has proven by far the most excitingly interesting intellectually, His range of erudition is from Goethe and the French authors to the nomenclature of flagellate protozoans or the latest mathematical philosophy or the behaviouristic hypothesis of Psychiatrists. or the principles of the Catholic Church — He is a most amazing personality, with the widest range of any I have met in my life I think.
~~He got~~ He has a way too as he used Bonari once to say of "getting to the bottom of things."
On this first of rides across with Zatek his wife & daughter who went with us from Havana to Panama on the S.S. Cartago Molino, the active interested young Panamanian assistant who took charge of the boys on the back of the car and Wheeler. I realize that we were in for an ~~[illegible]~~

intellectual treat and it has been one. I am ashamed that so few of Wheeler's remarkable ideas will be found in these notes for I was too busy hearing them to jot many of them down.

We went to the Annex in the Tivoli Hotel. when Wheeler was staying and the first evening took dinner with Wheeler at a down town restaurant. We got our meals at the Commissariat Restaurant where the food was very good + very cheap meals ranging fr 35¢ to 75¢ each. The Annex rate was $1.50 per day for rooms.

The next day we went out to Barro Colorado Island and left the boys with Banks who was already out there. Two days later we came back + the show was then on in full swing. Later Curt Richter came + and then the play of intellectual interest was simply like the play of fireworks. Once and a while Wheeler would go and lie down saying "This is too exciting too exciting".
We all funked in the same room and

in the morning like a lot of school girls sat on each other's trunks and discussed biological problems at a rate which was to me simply great.

Let me just recall some of the exciting things that I remember.

Wheeler discovered every day or two some new fungus cultivating ant. He showed me this new ant Wheeleromyrmex which lives with a fungus cultivating ant a Sericomyrmex (I think it is) as a friend. He discribed how he saw one of the host ants licking one of these Wheeler ants all over. He thinks they have a coating of some kind which the host ants like and this is why they tolerate it in the nest. The Wheeler ant feeds its own young, eats the mushroom hyphae and goes about just like the host ants. These live together as peacefully as the negroes do among us whites.

He called my attention to the behavior of the Stingless bees. Some of them smell like coconut

rancid coconut oil. There was one evening a swarming of a whole nest of Trigonas females. Young Trigonas females which came out about dusk and danced for 15 minutes violently in the air and then disappeared one by one back into their nest in a hollow tree. There were no males present.

The trails were swarmy with interesting insects. Banks brought in about 3000 & I picked them in bottles. He & Wheeler both say that the thing which amazed them was the extraordinary number of species represented by only a few individuals of a single kind. Whereas in the north we find myriads of individuals of the same species.

The Calobata performance which Banks discovered & which we all studied was an amazing thing and one which must affect any theory of heredity which may one gets up. As Wheeler says the trouble with our study of Biology is that we are animals — a part of Biology. The mathematician &

Physicists + Chemists can go far in their study of phenomena for they can get away completely in their ~~study~~ studies of things from themselves whereas we continually anthropomorphize — and cannot seem to help it. We view everything alive as though it had emotional nature of some kind or other like we have ourselves.

But then Calobatas not over 3/4 in long!

This courtship is as complicated even more so than that of most of the so called higher animals!

Wheeler says that in some species the male catches an insect and feeds it to the female before mating with it. In others it ~~blows bubbles~~ presents her with a leaf of stick or leaf. In other it blows a bubble with its mouth and presents it. In ~~this~~ the calobata it regurgitates a drop of fluid and deposits it on the ~~female's~~ side of the female's head and she takes it off with her foreleg and puts it in her mouth.

I cannot feel that it is an imaginary analogy with which we have to deal here. It means that before we can understand the phenomena of the living organisms around us we must stop this way we have of measuring things statically.

Everything is moving. Every attempt to interpret is ~~this~~ an attempt to stop the whirling things and take a mental photograph of them. It might be compared to the photographs of a horse in motion, jumping. We discuss everything in nature by comparing these abstractions which are purely static things.

Try to think for example of Man. ~~The~~ and then discuss his attributes. He is first just two half nuclei in two other individuals — then he is a ~~one~~ ~~whirl~~ collision of these two daughter nuclei in the uterus. Then he is a whirling storm of ions, dividing nuclei, splitting chromosomes, ~~cell~~ cell walls, streaming protoplasm forming proteins + decaying substances around that storm center. Then he

This reflection on life is the best I ever wrote and now Sept 1. 1945 - 24 yrs after it was written, I read it with a feeling of wonder

J.F.
Baddeck
No. 5

is visible as a thing large enough for the eye to see - reflecting light + appearing to the eyes of other creatures who have gone through the same performance edition as a ground hog! Later he appears as having a form which resembles ~~them~~ the mature thing. In time he leaves the darkness of the mother "cell" and is thrown out into the light ~~a through something~~ with the habits of his pre natal existence fixed on him. From birth on he is a familiar sight to others of his kind but he is travelling up to puberty + the reproductive stage and then down to senility and old age - always changing - never for a moment stopping in his swift flight from conception to the grave.

It is from this ~~mysterious~~ standpoint of a peek into the mysterious of existence that the Calobota should be viewed - not ~~from~~ by trying merely to think of them as though they were tiny human beings.

Is it not marvellous that creatures no larger than a pin should court one another with as remarkable a courtship - yes a more ceremonious courtship by far than ~~that~~ of a monkey - yes than ~~that~~ of millions of human beings? What does it mean? Either the behaviour of

humans is a cosmic thing fixed by cosmic laws ~~or~~ and not as man is so fond of believing a thing controlled by our wills, or these tiny creatures are controlled by their wills and their loves and are like the lovers which we admire in our human existence.

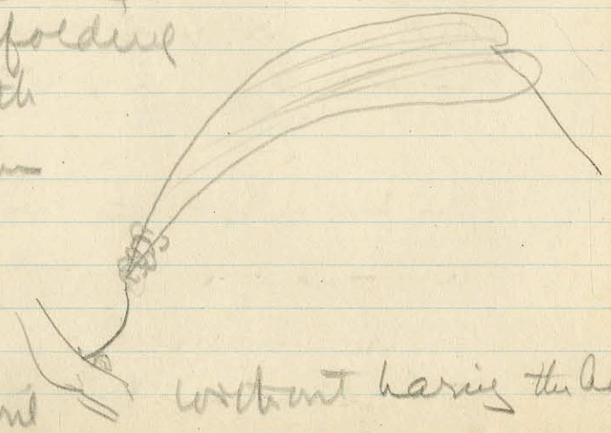
Standing there in the jungle with the sunlight playing on the leaves of a species of Piper + watching these creatures with Wheeler of Harvard and Richter of Johns Hopkins will long remain in my memory as one of the ~~amazing performances~~ most amazing things I have ever done. It was like peeking over into a new field of wonders which had heretofore been hidden from my view ~~so~~ that I did not even suspect its existence. ~~even~~. The dance of the male before the female, the mating posture of the female, the first kiss of the male, and the periodic regurgitations of the male wiped off by the forelegs of the female are facts of peculiar significance

if viewed from the standpoint of ~~biology~~ the behaviourist who is trying to explain sex.

Then too there are the snout beetles which ~~are~~ the ~~female~~ male has a special pair of pincers with which it pulls the female out when it gets its bill stuck in ~~the~~ wood when it is trying to make a hole in which to lay its eggs. I did not see this process but did the ~~[illegible]~~ pincers of the male which are of very peculiar construction.

The amazing lianas along the trails interested me. The ability of a tendril of one of these to grasp the very tip of a bamboo leaf and hold fast to it and pull itself up was amazing to me.

It does it by folding its slender length back & forth on the tip of the leaf. I found it impossible to detach the tendril without having the leaf-



The growth of aerial roots from the end of a giant liana in its attempt to reach the soil. I photographed & measured (See previous notes)

The strength of the aerial roots of what ~~Anthurium~~ I take to be Philodendron lacerum which hung from plants perched in the top branches of tall forest trees was such that Graham and Freddy hung & swung on them (See photos)

The extrafloral nectaries of the figs were tremendous — on very young leaves. Ants were drinking from them as horses would from great flat broad fountains. Nector drops gathered & filled these nectars at night & formed them full to overflowing in the morning.

The fights of ants & termites which we witnessed were as exciting as the cock fights we saw in Panama. The ants refused to fight — simply stalked about among the

termites like a large St Bernard dog does among a lot of puppies.
Certain small active ants fought the termite ~~bitt~~ to the death, I watched one hang on for 15 minutes to the antenna of a worker termite. How much longer he might have hung I dont know.

I am convinced that one could go ~~the~~ to B.C.C. & spend months studying these ant termite reactions towards each other.

The orchid Catysetum viridoflavum which the bees found on a stump in the lake has the characteristic of throwing its pollenodium some distance when ~~it~~ touched. Mr Powell told me he had seen it throw 2 feet from the flower. The pollenodium is of ~~a~~ large size & it sticks to the hand ~~with a vice~~ so firmly that it takes quite a pull to detach it.

Richter observed that the weeds and shoots coming up from the

stumps around the house ~~grow~~ have grown with ~~great~~ less rapidity than ~~the~~ weeds & water sprouts grow in the North. I am inclined to think he is right about it.

Of course the days were short 12 hours only and there ~~were~~ were many very cloudy days so that the amount of sun's energy expended was little in comparison with the sunlight on a summer day of 16 hours in the north.

The most amazing ant on the place was the Paraponera clavata a jet black stinging species which comes right out of its nest and attacks you. See photo.

Experiences with Plant Propagating Box.

a) The Zinc Plant Propagating Box has the advantage of being air tight. The idea of Kent of enclosing the wooden box completely in zinc & glass is a good one. It permits quick

access to the box without letting too much air to escape. I think side ventilating holes are unnecessary. I have not opened them and unless more heat develops than has on board ship so far I ~~should~~ dont think they would be necessary.

(B) ~~For a~~ A method of labelling the plants is required for one will want to pile it full of seeds seedlings & cuttings as well as economizing space & labels would make this difficult

(C) The method of cooling with damp burlap is all right and the top tank to hold water is ok. I think

(D) The danger of upsetting the plants when in the box & the cuttings falling out is great. I have not solved the problem of how to hold the Sphagnum down. Slats which would be moveable might do — or ~~sp~~ burlap full of many

holes. Possibly by watching to see that the box is kept always level in the best way.

(E) The danger from shock while the box is in a frigate shd turns out not to be so serious as I thought it would. Plants will stand a good deal of shade I find

(F) The ~~p~~ Chief trouble has been that the sun's heat is not enough to keep a high temperature at night. An electric apparatus or some other small heater will be necessary to supplement the sun's heat or the plants will not strike from cuttings even though they may callous.

(G) Some such collecting case for cuttings which I can carry on shore when we stop ashore and collect is essential. Since there is no electricity in Jaua ~~rather hotter~~ I think ~~an~~ an alcohol lamp will be necessary though at night there temperature of 80° at night be common

(H) Some wedges or metal clamps for making legs to level up the box on a sloping roof of a hatch as necessary.

(I) Better access to the box than the present wire lock is necessary.

(J) a slat shade for the plant box itself would be an advantage.

(K) Some way to use the sides of the box for sprouting seeds would be an advantage.

(L) It is entirely too heavy! Must be lighter.

At B.C. Lab. I kept the box just outside the lab. + filled stuff into it. and it remained about + 80° most of the time + to my surprise many of the plants retained their leaves, quite turgescent. Little sunlight. Not more than once did the temp go to over 90°F. I had little difficulty in keeping a differential

between the box + the sun box. by wetting down the burlap.

I put the following things in it in Cuba. Some have callowed + other died + been thrown out

Cuba
- Annona purpurea Dicd (Soncoya)
- ~~Sto~~ Cuttings.
- Bread fruit cuttings Dicd. ~~in P~~
- Momordica cochinchinensis cuttings still alive + callowed.
- Sterculea virginica one leaf with the cotyl. sclerous green seedlings in sand pots. Some still alive now.
- Citrus hystrix cuttings held color many days but failed to callow + finally, after 4 weeks died.
- Unidentified liana with thick brown rooted plac
- Bread fruit (seedless) for Frijoles.
- Heliconia hirsuta ? B.C. Dsl. Lobster's single plant. Trail.

Panama
- Rhodia laterifloro seeds
- Undetermined large flat seeds 2½ inch across
- Manicaria saccifera Monkey Cap Palm for ~~Flat~~ Sherman. large round dark palm seeds gummy.
- Monkey Fruit undetermined
- Prosopis - with red pods. for B.C. Lab. Dsolo de las Hormigas

Rheedia edulis. small seeded small fruited species in tin box

Heliconia mariae. ? dark seed in tin box

Heliconia (?) with white flowers in large bract. blue in color in tin box

Heliconia sp? ~~with~~ See Painting + Specimen long lax flower cluster

"Cahon de Elephante" large mucose seed. 3½ inch.

Immense flat seed undetermined seed. size of small saucer

Alpinia ~~with~~ pink fruits from Fat Sherman. 000 small fine seed. See photo by Freeds

Spondias lutea. Single young plant with pinnate compound leaves

Heliconia mariae seedling stipulate but may fall through

Acacia multiglandulosa, in tin box. May live!

I propose to put below in the sun box the following 6. potted seeds.

Pots 1+4 Rheedia latiflora

2-3-5-3 Heliconia (sp See Painting)

6 Heliconia mariae

? Probably not this species but R. madruno as evidenced by Kew Herb. Specimen See p. 219 of this book.

~~Heliconia ? with large white~~

Large seed of Ivory Nut Palm leaves in 5 pl[illegible] 3 lobed + [illegible]

Large seed [illegible]ma mamosa

FAIRCHILD WILL TALK AT BALBOA ON MANGOSTEEN

Star Herald 6-7-[illegible]

Department of Agriculture Man Will Deliver Illustrated Addresss Friday Night

Friday evening Doctor David Fairchild of the U. S. Department of Agriculture, will deliver an illustrated lecture on the Mangosteen, which is considered to be the queen of all tropical fruits. He is especially qualified to talk on this subject because he has spent years studying this fruit and introducing it into the U. S. and Canal Zone. We have now two dozen trees growing here which Doctor Fairchild sent, and he proposes to introduce many more so that we may boast of a big orchard soon.

While the Mangosteen is the main part of the lecture, he will also dwell on plant quarantines, explaining with good slides how necessary it is to have such protective measures here and how they do not in any way stop the introduction of plants, but rather how they help so that only healthy stock can enter.

Incidentally Doctor Fairchild will say something about other kinds of tropical fruits. He is a very enthusiastic lecturer and all who will hear his lecture will be glad they had not missed this opportunity.

The lecture will be given at the Community House in Balboa Friday evening at eight o'clock, and it will be free.

You know that W[illegible] JUICE, besides